

# MANUAL MOTOR STARTERS



# Ex9SN

## Manual Motor Starters

### Ex9SN Product Overview

# Features

Manual motor starters are electromechanical protection devices for the main circuit. They are used mainly to switch motors manually ON/OFF and protect them fuse less against short circuit and loss-phase. None-fuss protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds. Manual motor starter combinations are setup together with contactors and overload relays.

- Available with enclosed coils for protection against particle contamination
- Short-circuit protection
- Disconnect function
  - ✓ Overload protection
  - ✓ Loss-phase protection
- Suitable for three and single-phase application
- Trip-free mechanism
- Clear switch position indication ON/OFF/TRIP
- Lockable handle

## Manual Motor Starters

### Ex9SN National and International Standards

## Certifications

- IEC/EN 60947-2 and 60947-4-1
- CE Approved
- UL 508 Listed, File Number E467185, UL 60947-1 and 60947-4-1A
- CSA Certified 22.2 No. 14
- RoHS Compliant



# Manual Motor Starters

## Ex9SN Product Selection Guide

### Label



- 1 Adjustable Current Range
- 2 Rated Current
- 3 Test Button
- 4 Brand
- 5 Product Selection
- 6 OFF/ON Push Buttons or Rotary Handle with Padlock

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### Product Selection Guide

Ex9SN	25	A	0.16 A																												
NOARK Ex9SN Series	Frame Size	Style	Rated Current																												
	25: 25 A	A: Rotary Handle B: Pushbutton	<table border="0"> <tr><td>0.16A:</td><td>0.1~0.16 A</td></tr> <tr><td>0.25A:</td><td>0.16~0.25 A</td></tr> <tr><td>0.4A:</td><td>0.25~0.4 A</td></tr> <tr><td>0.63A:</td><td>0.4~0.63 A</td></tr> <tr><td>1A:</td><td>0.63~1 A</td></tr> <tr><td>1.6A:</td><td>1~1.6 A</td></tr> <tr><td>2.5A:</td><td>1.6~2.5 A</td></tr> <tr><td>4A:</td><td>2.5~4 A</td></tr> <tr><td>6.3A:</td><td>4~6.3 A</td></tr> <tr><td>10A:</td><td>6.3~10 A</td></tr> <tr><td>14A:</td><td>9~14 A</td></tr> <tr><td>18A:</td><td>13~18 A</td></tr> <tr><td>23A:</td><td>17~23 A</td></tr> <tr><td>25A:</td><td>20~25 A</td></tr> </table>	0.16A:	0.1~0.16 A	0.25A:	0.16~0.25 A	0.4A:	0.25~0.4 A	0.63A:	0.4~0.63 A	1A:	0.63~1 A	1.6A:	1~1.6 A	2.5A:	1.6~2.5 A	4A:	2.5~4 A	6.3A:	4~6.3 A	10A:	6.3~10 A	14A:	9~14 A	18A:	13~18 A	23A:	17~23 A	25A:	20~25 A
0.16A:	0.1~0.16 A																														
0.25A:	0.16~0.25 A																														
0.4A:	0.25~0.4 A																														
0.63A:	0.4~0.63 A																														
1A:	0.63~1 A																														
1.6A:	1~1.6 A																														
2.5A:	1.6~2.5 A																														
4A:	2.5~4 A																														
6.3A:	4~6.3 A																														
10A:	6.3~10 A																														
14A:	9~14 A																														
18A:	13~18 A																														
23A:	17~23 A																														
25A:	20~25 A																														

## Manual Motor Starters Ex9SN 25 A Rotary Handle and Pushbutton



### 25 A

Rated Current Amp (Min-Max)	Rotary Handle		Pushbutton	
	Product	Part Number	Product	Part Number
0.1~0.16	Ex9SN25A0.16A	1500001	Ex9SN25B0.16A	1500015
0.16~0.25	Ex9SN25A0.25A	1500002	Ex9SN25B0.25A	1500016
0.25~0.4	Ex9SN25A0.4A	1500003	Ex9SN25B0.4A	1500017
0.4~0.63	Ex9SN25A0.63A	1500004	Ex9SN25B0.63A	1500018
0.63~1	Ex9SN25A1A	1500005	Ex9SN25B1A	1500019
1~1.6	Ex9SN25A1.6A	1500006	Ex9SN25B1.6A	1500020
1.6~2.5	Ex9SN25A2.5A	1500007	Ex9SN25B2.5A	1500021
2.5~4	Ex9SN25A4A	1500008	Ex9SN25B4A	1500022
4~6.3	Ex9SN25A6.3A	1500009	Ex9SN25B6.3A	1500023
6.3~10	Ex9SN25A10A	1500010	Ex9SN25B10A	1500024
9~14	Ex9SN25A14A	1500011	Ex9SN25B14A	1500025
13~18	Ex9SN25A18A	1500012	Ex9SN25B18A	1500026
17~23	Ex9SN25A23A	1500013	Ex9SN25B23A	1500027
20~25	Ex9SN25A25A	1500014	Ex9SN25B25A	1500028

Specifications .....	F157 to 158	Wiring Diagram .....	F160	Accessories.....	F162 to 165
Dimensions.....	F159	Mounting Positions .....	F161		

# Manual Motor Starters

## Ex9SN Specifications

Operating Conditions	
Tripping Class	Class 10 & 10 A
Temperature	-13 °F to 158 °F (-25 °C to +70 °C) Average temperature in 24 hours not exceed 95 °F (-35 °C)
Altitude	Not to exceed 6,562 ft (2,000 m)
Air Conditions	At mounting site, relative humidity not exceed 50% at the max temperature of 104 °F (+40 °C), higher relative humidity is allowable under lower temperature
Pollution Grade	Grade III
Release Grade	10 A (SN25)
Rated Operational Frequency	50/60 Hz
Mounting Conditions	The inclination between the mounting plane and the vertical plane shall not exceed 5°. The product shall be installed and operated at a place without obvious shake, impact and vibration.
Rated Insulation Voltage Ui (V)	IEC 690 V, UL/CSA 600 V
Rated Operational Voltage Ue (V)	230/340, 400/415, 440, 50, 690
Rated Impulse Withstand Voltage Uimp (V)	8,000

Overload Protection Properties						
Series Number	Multiple of Setting Current	Initial Status	Time		Expected Results	Ambient Temperature
1	1.05	Cold Status	t≥2h		Non-Tripping	68°F to ±35.6°F (+20°C to ±2°C)
2	1.20	Heat Status (right after test 1)	t<2h		Tripping	
3	1.50		Tripping Class	10 A t<2 min. 10 t<4 min.		
4	7.20	Cold Status	Tripping Class	10 A 2s<t≤10s 10 4s<t≤10s		

Phase Failure Protection Properties						
Series Number	Multiple of Setting Current		Initial Status	Time	Expected Results	Ambient Temperature
	Any 2 Phase	The Other Phase				
1	1.0	0.9	Cold Status	t≥2h	Non-Tripping	68°F to ±35.6°F (+20°C to ±2°C)
2	1.15	0	Heat Status (right after test 1)	t<2h	Tripping	

Temperature Compensation Properties						
Series Number	Multiple of Setting Current		Initial Status	Time	Expected Results	Ambient Temperature
1	1.0		Cold Status	t≥2h	Non-Tripping	104°F to ±35.6°F (+40°C to ±2°C)
2	1.2		Heat Status (right after test 1)	t<2h	Tripping	
3	1.05		Cold Status	t≥2h	Non-Tripping	-23°F to ±35.6°F (-5°C to ±2°C)
4	1.3		Heat Status (right after test 1)	t<2h	Tripping	

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## Manual Motor Starters

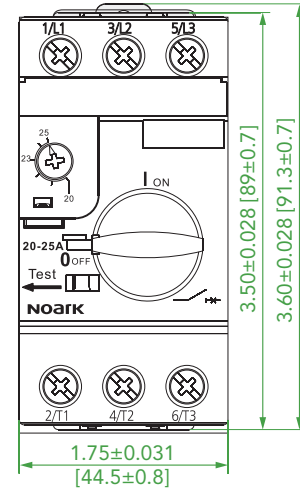
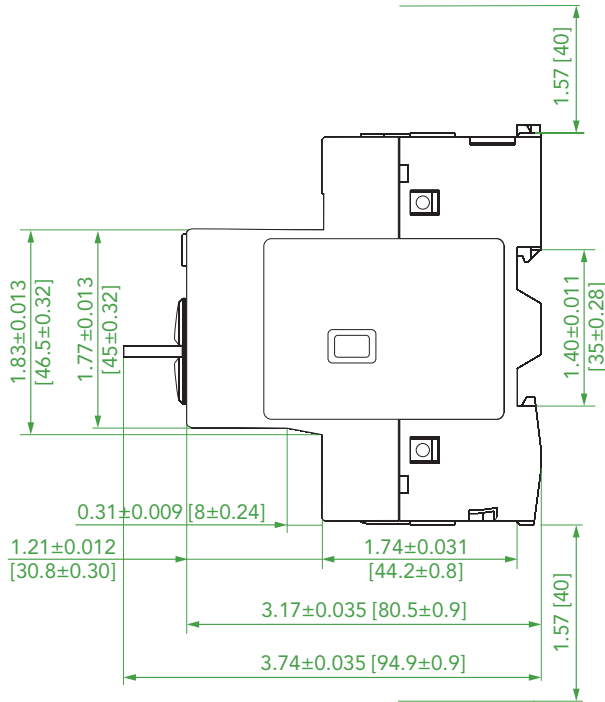
### Ex9SN Specifications

Setting Current Range (A)		0.1~ 0.16	0.16~ 0.25	0.25~ 0.4	0.4~ 0.63	0.63~ 1	1~1.6	1.6~ 2.5	2.5~4	4~6.3	6.3~ 10	9~14	13~18	17~23	20~25			
Rated Current of Release		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	10	14	18	23	25			
<b>UL Ratings</b>																		
Single-Phase (HP)	120 Vac						-	-	1/8	1/4	1/2	3/4	1	1.5	2			
	240 Vac					-	1/10	1/6	1/3	1/2	1.5	2	3					
Three-Phase (HP)	240 Vac	-	-	-	-		-	1/2	1	1.5	3		7.5					
	480 Vac					1/2	3/4	1	2	3	5	10	10	15				
	600 Vac							1.5	3	5	7.5	10	15	20				
<b>IEC Ratings</b>																		
400/415 Vac	Icu (kA)	100						100			15							
	Ics % Icu	100						100			50			40				
690 Vac	Icu (kA)	100						100			3							
	Ics % Icu	100						100			75							
Rated Ultimate Short-Circuit Breaking Capacity Icu (kA)	230/240 V	100						100			100			50				
	400/415 V	100						100			15			15				
	440 V	100						50			15			8			6	
	480/500 V	100						50			10			6			4	
	660/690 V	100						100			3							
Rated Service Short-Circuit Breaking Capacity Ics (kA)	230/240 V	100						100			100			50				
	400/415 V	100						100			7.5			6				
	440 V	100						50			15			4			3	
	480/500 V	100						50			10			4.5			3	
	660/690 V	100						100			2.25							
Arcing Distance		1.57 in (40 mm)																
Standard Rated Power of Three-Phase Motor (kW)	230/240 V					-	-	0.37	0.75	1.1	2.2	3	4	5.5				
	400 V					-	-	0.37	0.75	1.5	2.2	4	5.5	7.5	11			
	415 V					-	-	-	0.75	1.5	2.2	4	5.5	9	11	11		
	440 V					0.37	0.55	0.75	1.1	2.2	3.7	5.5	7.5	9	11	15		
	500 V					0.37	0.55	0.75	1.1	2.2	3.7	5.5	7.5	9	11	15		
660/690 V					0.37	0.55	1.1	1.5	3	4	7.5	9	11	15	18.5			
Current Setting Value of Instantaneous Electromagnetic Release Ir (A)		1.5	2.4	5	8	13	22.5	33.5	51	78	138	170	223	327				
Current Rating of Fuse-Link of Back-Up Fuse, Which is Only Needed in Case of Icc>Icu (Icc: Prospective Short-Circuit Breaking Current)	230/240 V	100						100			100			80				
	aM A	100						100			100			100				
	gl/gG A	100						100			100			100				
	400/415 V	100						100			100			80				
	aM A	100						100			100			80				
	gl/gG A	100						100			100			100				
	440 V	100						100			100			63				
	aM A	100						100			100			63				
	gl/gG A	100						100			100			80				
	500 V	100						100			100			50				
aM A	100						100			100			50					
gl/gG A	100						100			100			63					
★: Fuse is not Required	690 V	100						100			100			40				
aM A	100						100			100			40					
gl/gG A	100						100			100			50					
Degree of Protection		IP2L0																

## Manual Motor Starters Ex9SN Dimensions

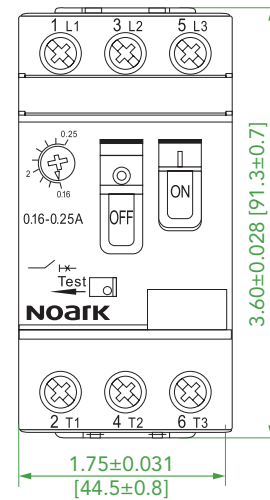
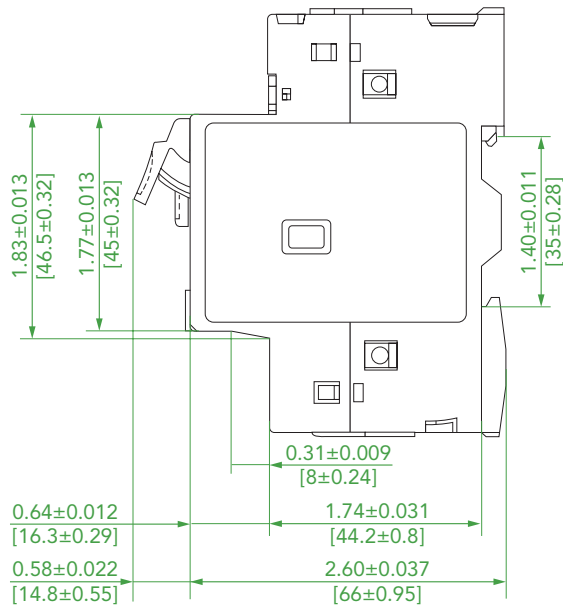
### Ex9SN25A

Unit: in. [mm]



### Ex9SN25B

Unit: in. [mm]

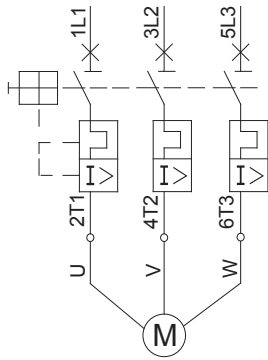


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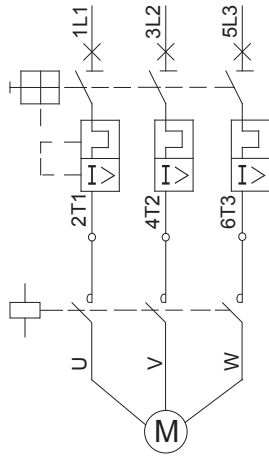


## Manual Motor Starters Ex9SN Wiring Diagram

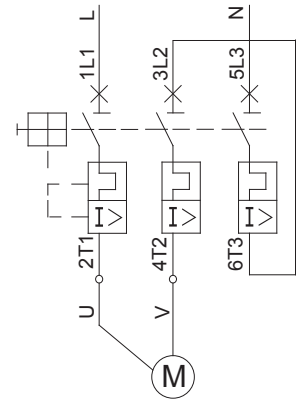
### Ex9SN25A/B



Operating principle diagram of starter



Principle connection diagram of starters and contactors



Principle connection diagram of single-phase or DC motor

# Manual Motor Starters

## Ex9SN Accessories: Auxiliary Contact and Enclosure



ASNA



ASNB

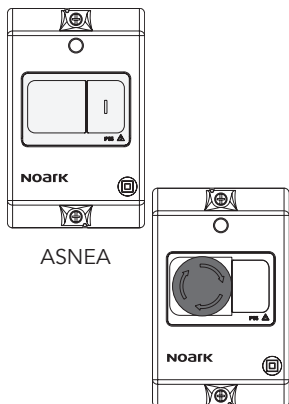


ASNF

ASN	A	11
Description	Type	Auxiliary Contact
Manual Motor Starter Accessory	A: Auxiliary Contact Side Mount	11: 1NO+1NC
	B: Auxiliary Contact Front Mount	20: 2NO
	F: Auxiliary Contact with Fault Signal Contact	1001: 1NO (Fault)+ 1NC (Auxiliary)
		0101: 1NC (Fault)+ 1NC (Auxiliary)
		1010: 1NO (Fault)+ 1NO (Auxiliary)
		0110: 1NC (Fault)+ 1NO (Auxiliary)

Accessory Description	Type	Product	Part Number
Auxiliary Contact	Side Mount	ASNA11	1500030
		ASNA20	1500029
	Front Mount	ASNB11	1500032
		ASNB20	1500031
	Fault Signal Contact	ASNF1001	1500041
		ASNF0101	1500042
	ASNF1010	1500043	
	ASNF0110	1500044	

Specifications ..... F163-164  
Dimensions ..... F165



ASNEA



ASNEB

ASN	EA
Description	Type
Manual Motor Starter Accessory	EA: Enclosure with Actuating Diaphragm
	EB: Enclosure with Emergency Stop Pushbutton

Accessory Description	Product	Part Number
Enclosure	1500045	ASNEA
	1500046	ASNEB

Specifications ..... F163-164  
Dimensions ..... F166

## Manual Motor Starters

### Ex9SN Accessories: Shunt Trip and Under-Voltage Release



Specifications ..... F163-164  
Dimensions..... F165

ASN	T	A
Description	Type	Rated Voltage
Manual Motor Starter Accessory	T: Shunt Trip Release	A: 110~115 Vac 50 Hz 127 V 60 Hz
		B: 220~240 Vac 60 Hz
		C: 380~400 Vac 50 Hz 440 V 60 Hz
		D: 380~400 Vac 60 Hz

Accessory Description	Product	Part Number
Shunt Trip Release (Side Mount)	ASNTA	1500037
	ASNTB	1500038
	ASNTC	1500039
	ASNTD	1500040



Specifications ..... F163-164  
Dimensions..... F165

ASN	UV	A
Description	Type	Rated Voltage
Manual Motor Starter Accessory	UV: Under-Voltage Release	A: 110~115 Vac 50 Hz 127 V 60 Hz
		B: 220~240 Vac 60 Hz
		C: 380~400 Vac 50 Hz 440 V 60 Hz
		D: 380~400 Vac 60 Hz

Accessory Description	Product	Part Number
Under Voltage Release (Side Mount)	ASNUVA	1500033
	ASNUVB	1500034
	ASNUVC	1500035
	ASNUVD	1500036

# Manual Motor Starters

## Ex9SN Accessory Specifications

	Auxiliary Contact			Enclosure		Shunt Trip Release	Under Voltage Release		
	Side Mount	Front Mount	Fault Signal Contact	Actuating Diaphragm	Emergency Stop Pushbutton				
	ASNA	ASNB	ASNF	ASNEA	ASNEB	ASNT	ASNUV		
UL File Number	E467185								
<b>UL Ratings</b>									
Electrical Contact Type	B600	D300	Fault: D300 Auxiliary: B600			-			
Rated Insulation Voltage Ui (V)	690	250	690			690			
Voltage Range of Operation	-					35~70% Ue		70~110% Ue	
Ue Max (V)	690	250	Fault: 240 Auxiliary: 690			-			
Conventional Heating Current Ith (A)	6	2.5	Fault: 2.5 Auxiliary: 6						
AC-15	720 Vac 240 V	120 Vac 240 V	Fault: 720 Vac/240 V Auxiliary: 720 Vac/240 V						
<b>IEC Ratings</b>									
IEC File Number	IEC/EN 60947-5-1					IEC/EN 60947-2			
Pick-Up Voltage (Un)						0.7~1.1	0.85~1.1		
Drop-Off Voltage (Un)						0.75~0.2	0.7~0.35		
IP Class						IP 55	IP 55		

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## Manual Motor Starters Ex9SN Accessory Specifications

Utilization Category	Auxiliary Contact				
	Side Mount	Front Mount	Fault Signal Contact		
	ASNA	ASNB	ASNF		
	AC-15		AC-14		
Rated Operational Current I <sub>e</sub> (A)	24 Vac	-	2	1.5	
	48 Vac	6	1.25	1	
	110/127 Vac	4.50	1	0.50	
	230/240 Vac	3.30	0.50	0.30	
	380/415 Vac	2.20	-		
	440 Vac	1.50			
	500 Vac	1			
	690 Vac	0.60			
	DC-13				
	24 Vdc	6			1
	48 Vdc	5	0.30		
	60 Vdc	3	0.15		
110 Vdc	1.30	-			
220 Vdc	0.50				
	AC-15				
Normal Operational Power P (W)	24 Vac	-	48	36	
	48 Vac	300	60	48	
	110/127 Vac	500	127	72	
	230/240 Vac	720	120		
	380/415 Vac	850	-		
	440 Vac	650			
	500 Vac	500			
	690 Vac	400			
	DC-13				
	24 Vdc	140			24
	48 Vdc	240	15		
	60 Vdc	180	9		
110 Vdc	140	-			
220 Vdc	120				
Operational Features (Times)	-		1,000		

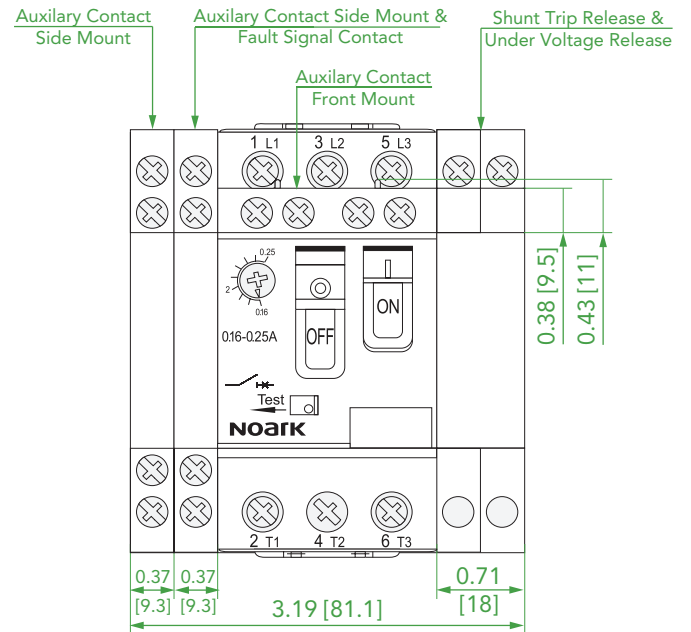
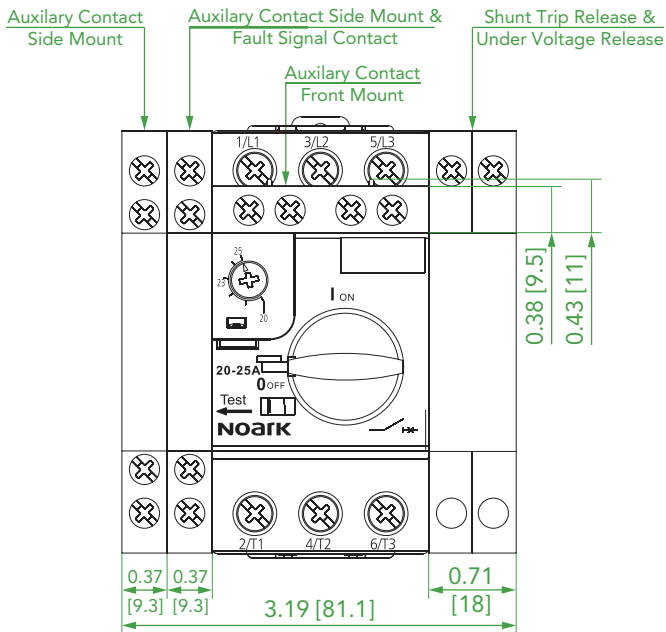
Utilization Category	Auxiliary Contact			
	Fault Signal Contact			
	ASNF			
	AC-14	AC-15	DC-13	
Connection	I/I <sub>e</sub>	6	10	1.10
	U/U <sub>e</sub>	1.10		
	Cos $\phi$ or t 0.95	0.70	0.30	6 Pe
Disconnection	I/I <sub>e</sub>	6	10	1.10
	U/U <sub>e</sub>	1.10		
	Cos $\phi$ or t 0.95	0.70	0.30	6 Pe
Number of On/Off Operation Cycles and Operation Frequency	Number of Operation Cycles	10		
	Number of Operation Cycles Per Minute	2		
	On Power Time	0.05		

# Manual Motor Starters

## Ex9SN Accessory Dimensions

### Manual Motor Starter with Accessories

Unit: in. [mm]

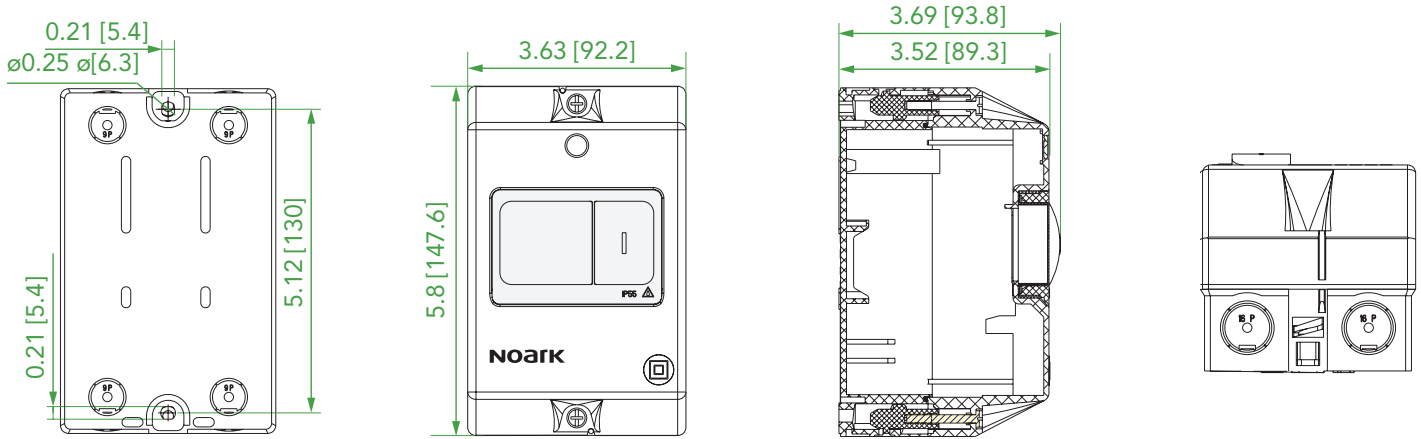


## Manual Motor Starters Ex9SN Accessory Dimensions

### ASNEA

Enclosure with Actuating Diaphragm

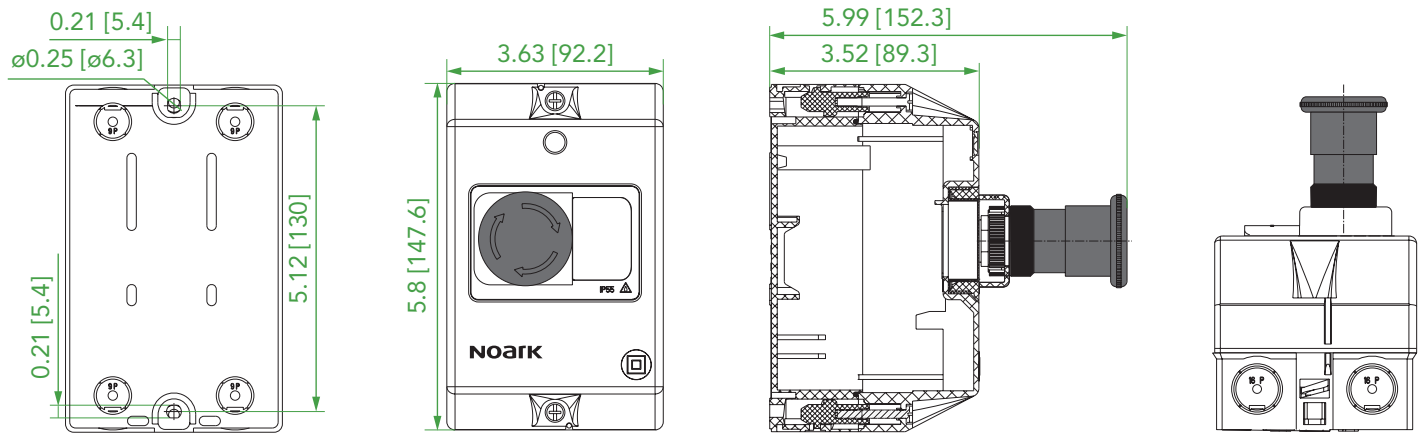
Unit: in. [mm]



### ASNEB

Enclosure with Emergency Stop Pushbutton

Unit: in. [mm]








# NOARK



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